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3 A GRANULAR HERBICIDE SPREADER FOR
LABORATORY AND GREENHOUSE EXPERIMENTS

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~~X~~ A GRANULAR HERBICIDE SPREADER FOR LABORATORY
AND GREENHOUSE EXPERIMENTS ~~X~~

3a/ ~~c by~~ L. L. Danielson and J. F. Mullins 1/

Effective granular herbicide research requires accurate and uniform distribution of granules on various substrates. In earlier studies, tractor-drawn 2/ and hand-propelled 3/ granule spreaders that employ an auger enclosed in a slotted tube as the metering device were designed for field plot research. Gravity flow is avoided by using this metering principle and delivery is uniform and highly accurate.

Granule spreaders of high accuracy are also critically needed for laboratory and greenhouse experiments on granular herbicides. The auger metering principle was used in the present study to devise a granule spreader for such experiments (figures 1 and 2).

The cold-rolled steel auger has an acme 1 inch 4P thread and is enclosed in a structural aluminum alloy tube slotted on 2-1/4 inch centers on the top and bottom (figure 3). Granules enter a top slot and are augered laterally 1 inch for delivery through a bottom slot. The auger tube is 24 inches long and contains 10 slots each on top and bottom. The hopper height is 2-1/4 inches. The hopper and auger are easily removable from the supporting frame for cleaning and servicing.

The spreader is mounted on a moving belt sprayer table and is adjustable to a maximum of 3 feet above belt level. An 1,800 rpm, 1/6-horse synchronous motor with a 40 to 1 gear reduction turns the auger through a no. 25, 1/4 inch pitch chain and sprocket drive. The auger-sprocket has 20 teeth. Sprocket ratios of 1/1 to 4/1, motor to auger, combined with variable belt speeds of 1 to 4 mph gives a broad selection of application rates. The splash pan, placed just below the auger, is 6 inches wide and hinged to allow angular adjustment. Data showing the high accuracy of the auger-metering device used here have been presented in a previous publication 2/.

The granule spreader described here has proved valuable in small scale greenhouse and laboratory experiments on granular herbicide performance and persistence. It should be equally useful in similar research on granular insecticides, fungicides, and nematocides.

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- 1/ Plant Physiologist and Design Engineer (retired) respectively, Crops Research and Soil and Water Conservation Research Divisions, ARS, USDA, Beltsville, Md.
- 2/ Danielson, L. L. and Chambers, P. P. A field distributor for granular herbicides. Weeds 5(2):108-111, 1957.
- 3/ Danielson, L. L. A granular herbicide distributor for small experimental plots. U.S. Dept. Agr., Agr. Res. Serv., ARS 34-11, 7 pp. 1960.

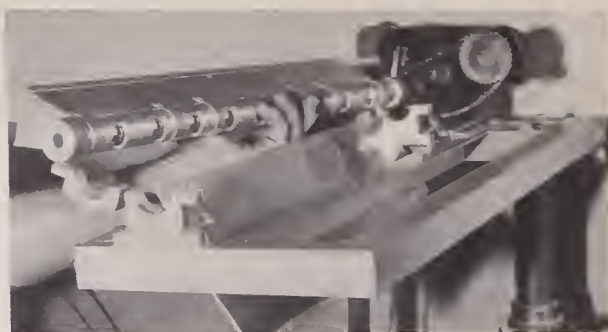
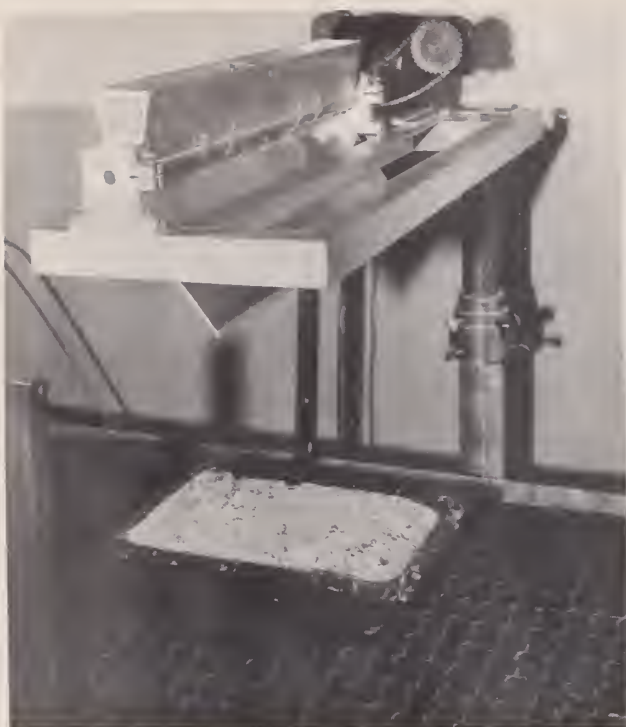


Figure 2.--Granule spreader dismounted for cleaning and servicing. Note lock hinges and slot arrangements on auger tube.

Figure 1.--Granule spreader mounted on moving belt sprayer table.

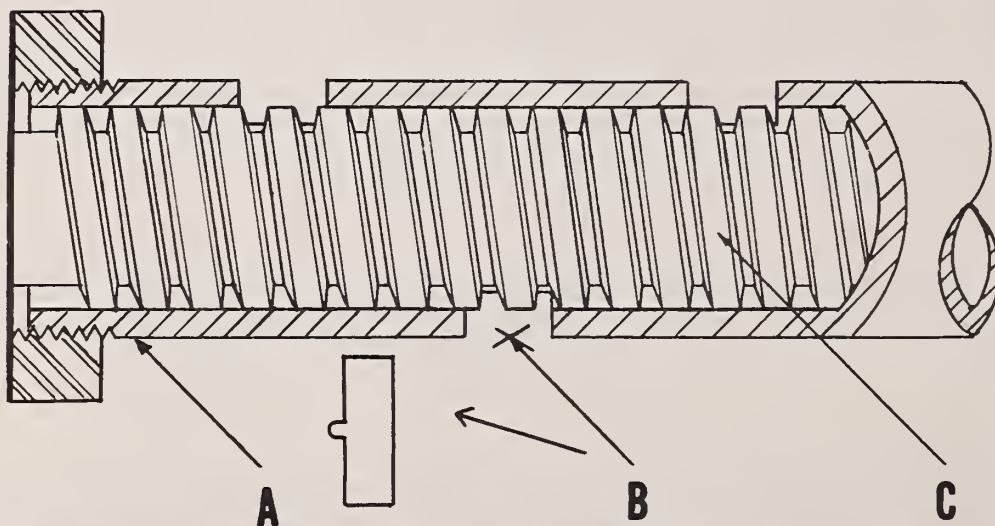


Figure 3.--Section of auger and slotted tube showing: (A) 24 ST aluminum tubing 1 1/4 inch OD 1/8 inch wall; (B) slots 9/16 inch wide and 1/4 inch deep with 1/4 inch notch cut on feeding edge to minimize pulsing in delivery; and (C) cold-rolled steel auger with an acme 1 inch 4P thread. Distance between adjacent slots on upper and lower sides is 2 1/4 inches center to center. Distance between upper and adjacent lower slot is 1 1/8 inch center to center.